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cially in winter when other things may not be readily obtained, and for the extreme ease of preparation.—T. J. BURRILL.

**Laboratory Articles in Back Numbers.**—This journal has already published considerable, during its ten years of existence, in reference to laboratories. To make this scattered information more readily serviceable, we here-with give references to the more important articles and items:

*Teaching and means of illustration.*—Methods of teaching, VI, 233, 302; Making of charts, VI, 186.

*Instruments and material.*—Convenient dissecting microscope, III, 37; Compound microscopes for botanical work, VI, 193; Apparatus for measuring growth, VI, 172; Stopper for bacteria culture vessels, X, 308; Material for laboratory use, IV, 196, V, 133, VI, 244, 294, VII, 10, 35, 125.

*Manipulation.*—Section cutting, V, 28, VI, 194; Mounting, V, 27, VI, 194; Staining, IV, 201, V, 65; Cleaning cover-glasses, V, 30.

*Physiological demonstrations.*—Direct observation of the movement of water in plants, VIII, 260; Study of ovules and germinating pollen grains, X, 353; Growing fern prothallia, X, 356; Cultivation of spores, VI, 204; Cultivation of bacteria, X, 391; Demonstration of continuity of protoplasm, VIII, 323, X, 322.

*Herbarium work.*—Applying pressure in making botanical specimens, I, 21; Pressing to preserve color, VI, 256; Cement for herbarium, IV, 215, IX, 62; Carbon bisulphide for preserving plants, II, 101.

## EDITORIAL NOTES.

THE NEW botanical laboratory at the University of Strassburg cost \$130,000.

HOGG's standard work on the microscope has reached its eleventh edition.

EDMOND BOISSIER, a well known botanist, died September 25, at Valleyres, Switzerland, at 76 years of age.

DR. GRAY WRITES: *Coreopsis delphinifolia* has been lost from the Botanic Garden at Cambridge. Who can generously supply it anew, from roots or seeds?

BACTERIOLOGY receives the chief attention of the new Institute of Hygiene recently founded in connection with Berlin University, and presided over by Dr. Koch.

IT MAY BE interesting to know that the contributors to the Gray vase represent several provinces of British America and thirty-three States and Territories of the Union.

OUR JANUARY NUMBER will contain a portrait and biographical sketch of Dr. Asa Gray, together with a few of the congratulatory addresses and poems sent to him on his last birthday.

THE SHAW SCHOOL OF BOTANY was opened November 6, with a public lecture by Dr. Trelease, to be followed by a course of four lectures on fertilization of flowers. The laboratory work began promptly with fifteen students, who took up the study of grasses.

THE NEW LABORATORY for the investigation of plant diseases in the Agricultural Department at Washington, makes slow progress toward securing an outfit, owing to lack of funds. It is hoped that Congress will make early provision for this need at its present session.

WE HAVE MADE arrangements by which any who desire can obtain excellent cabinet photographs of both sides of the Gray vase, which, of course, far sur-

pass any engraving that can be made. They can be had at 50 cents per pair, or single ones of either side at 25 cents, by addressing PACH'S STUDIO, CAMBRIDGE, MASS.

AN EXCERPT from the transactions of the Kansas Academy of Sciences gives a list of the parasitic fungi of Kansas by Professor Kellerman. It includes 181 numbers and closes with indices of genera and host plants. *Septoria Kellermaniana*, a new species by von Thuemen, on *Vitis cordifolia*, is described; the other new species await description in the Torrey Bulletin.

THE MOST immediate relative of the mahogany tree, *Swietenia humilis*, Zucc., has never been found since it was collected by Karwinski, more than fifty years ago. Considerable interest consequently attaches to fine specimens of flowers, leaves and mature fruit which have recently been sent to the Gray Herbarium by M. Dugés. This species, like its congener, is an inhabitant of tropical Central America.

THE LAST NUMBER of *Drugs and Medicines of N. A.* contains some excellent figures of medicinal plants and quite sustains the promise of preceding numbers. In the figure of *Aquilegia Canadensis*, however, the artist forgot the five styles which ought to be exerted from the stamen cluster. *Aconitum Columbianum* Nutt. should be written instead of *A. Fischeri*, as our American species is distinct from its Asiatic representative. Cf. Bot., Calif., ii. 428.

PROFESSOR TRELEASE's paper on "Several zoogloæ and related forms" contains descriptions of new species of chromogenous bacteria as follows: *Bacterium candidum*, *B. aurantiacum*, *B. luteum*, *B. chlorinum* and *B. incarnatum*. The other species studied were *Micrococcus candidus* Cohn, *Bacterium tumescens* Zopf, *B. violaceum* Bergonz., *B. hyalinum* Ktz., *Cladotrix dichotoma* Cohn, *Leptothrix buccalis* Robin, *Saccharomyces glutinus* (Fres.), and var. *candidus* of the same, named by Trelease.

THE MOVEMENTS of protoplasm in plant cells is much interfered with by the usual method of sectioning and mounting in water. Dr. de Vries has had marked success by using a 5 per cent. sugar solution for moistening the knife and mounting. After mounting, the solution is removed from under the cover-glass by means of blotting paper and a fresh drop supplied. The preparation is then allowed to stand an hour or two before examination to permit the protoplasm to recover its mobility.

INTERESTING EXPERIMENTS have been tried on the temperature of growing fruits by Dr. Ord, given in the *British Medical Journal*. He used a slender, pointed thermometer which could be easily thrust into the fruit. The trials were made on cucumbers in a hot-house, and the variations due to fluctuation were indicated by the temperature of a bottle of water suspended at the side of the fruit. A difference of one or two degrees was found between the temperature of green fruit and the air or water in the bottle, the latter two usually varying one way or the other by about a degree; a difference of a degree was also recorded between the two extremities of the fruit, which represent different stages of growth. This is suggestive of an interesting line of research.

THE OCCURRENCE of protoplasmic rotation in plant cells has recently been carefully investigated by Dr. H. de Vries. With the exception of *Vallisneria* and *Anacharis* it is usually noticed in cells which are not united into tissue, e. g., filaments of fungi, algæ, *Chara* and *Nitella*, and in higher plants in hairs, pollen tubes and very young embryos. He sought to determine if it did not occur in other cells, and has arrived at the conclusion that (1) it occurs in cells of the most diverse tissues, and that (2) it may be observed in all strongly growing cells in any organ taken from large, vigorously assimilating plants. *Tradescantia rosea* and *Tropæolum majus* were the special examples investigated.